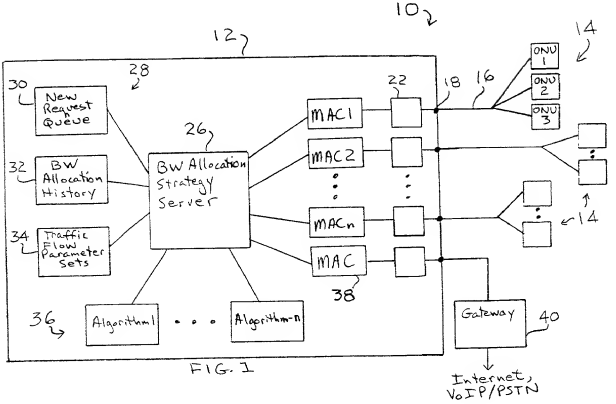
10
12
14
ONU 1
ONU 2
ONU 3
30
New Request Queue
28
22
18
16
MAC1
MAC2
MACn
MAC
26
BW Allocation Strategy Server
32
BW Allocation History
34
Traffic Flow Parameter Sets
36
Algorithm1
Algorithm-n
38
Gateway
40
Internet, VoIP/PSTN

FIG. 1

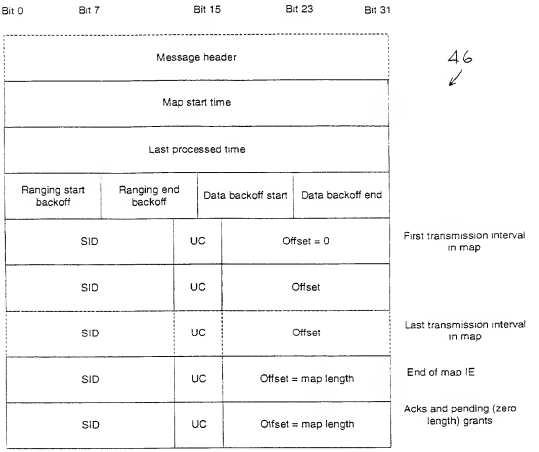
Bit 0
Bit 7
Bit 15
Bit 23
Bit 31
Message header
Map start time
Last processed time
Ranging start backoff
Ranging end backoff
Data backoff start
Data backoff end
SID
UC
Offset = 0
First transmission interval in map
SID
UC
Offset
SID
UC
Offset
Last transmission interval in map
SID
UC
Offset = map length
End of map IE
SID
UC
Offset = map length
Acks and pending (zero length) grants
46

FIG. 3

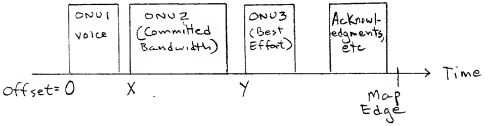
Transmission Intervals for SIDs
ONU1 Voice
ONU2 (Committed Bandwidth)
ONU3 (Best Effort)
Acknowledgements etc
Time
Offset=0
X
Y
Map Edge

FIG. 4

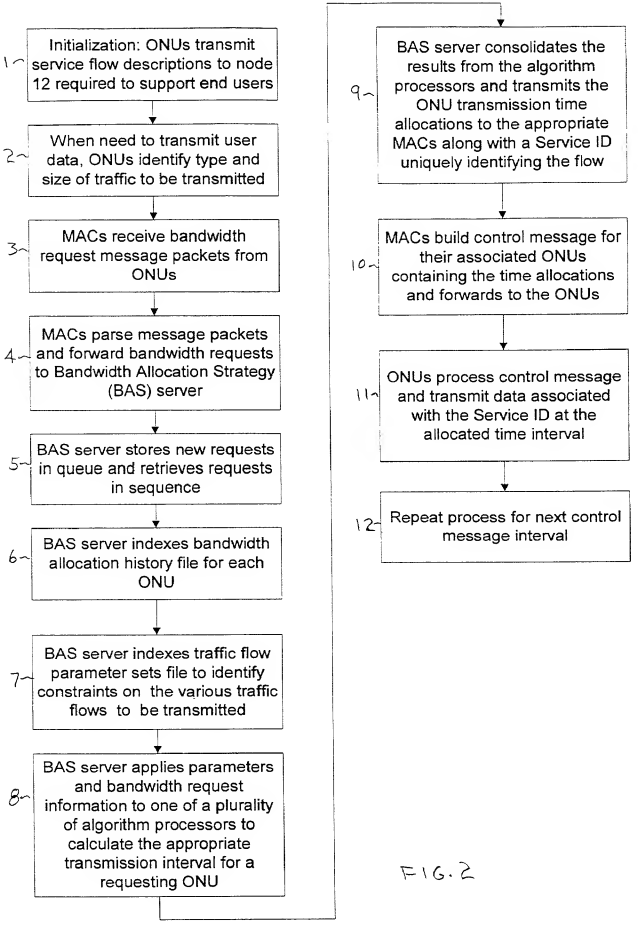
1 Initialization: ONUs transmit service flow descriptions to node 12 required to support end users
2 When need to transmit user data, ONUs identify type and size of traffic to be transmitted
3 MACs receive bandwidth request message packets from ONUs
4 MACs parse message packets and forward bandwidth requests to Bandwidth Allocation Strategy (BAS) server
5 BAS server stores new requests in queue and retrieves requests in sequence
6 BAS server indexes bandwidth allocation history file for each ONU
7 BAS server indexes traffic flow parameter sets file to identify constraints on the various traffic flows to be transmitted
8 BAS server applies parameters and bandwidth request information to one of a plurality of algorithm processors to calculate the appropriate transmission interval for a requesting ONU
9 BAS server consolidates the results from the algorithm processors and transmits the ONU transmission time allocations to the appropriate MACs along with a Service ID uniquely identifying the flow
10 MACs build control message for their associated ONUs containing the time allocations and forwards to the ONUs
11 ONUs process control message and transmit data associated with the Service ID at the allocated time interval
12 Repeat process for next control message interval

FIG. 2